

Section-A
(Multiple Choice Questions (MCQ's))

M.Marks: 20

Time: 20 Minutes

Q.1 Select the correct answer for each from the given option:

- (i) An angle with measure less than 90° is called _____.
 (a) Right Angle (b) Acute Angle
 (c) Obtuse Angle (d) None of these
- (ii) A triangle having two sides congruent is called _____.
 (a) Scalene triangle (b) Isosceles triangle
 (c) Equilateral triangle (d) None of these
- (iii) The sub duplicate of 4 : 9 is _____.
 (a) 2 : 3 (b) 16 : 81 (c) 8 : 18 (d) None of these
- (iv) A circle which passes through three vertices of a triangle is called the _____ of the triangle.
 (a) Escribed circle (b) Circum circle
 (c) Inscribed circle (d) None of these
- (v) $\operatorname{Cosec} 40^\circ =$ _____.
 (a) $\sin 40^\circ$ (b) $\sec 40^\circ$ (c) $\sec 50^\circ$ (d) $\sin 50^\circ$
- (vi) Cartesian product of sets A and B is written as:
 (a) A, B (b) $A \times B$ (c) $A \Delta B$ (d) $B \times A$
- (vii) $(-3, -2)$ is in _____ quadrant.
 (a) Second (b) Third (c) Fourth (d) None of these
- (viii) Product of a conjugate pair of binomial surds is a _____ numbers.
 (a) Real (b) Even (c) Rational (d) Odd
- (ix) The degree of the Polynomial $x + y + xy^2$ is _____.
 (a) 2 (b) 3 (c) 4 (d) 0
- (x) The natural logarithm has the base _____.
 (a) π (b) 10 (c) e (d) 1
- (xi) The sum of 10 observations is 125, the mean is _____.
 (a) 15 (b) 75 (c) 50 (d) None of these
- (xii) The solution set of $\sqrt{y-2} = -4$ _____.
 (a) 18 (b) ± 4 (c) { } (d) None of these
- (xiii) The solution set of $|3x| = 6$ is _____.
 (a) { 2 } (b) { -2 } (c) { -2, 2 } (d) None of these
- (xiv) The measure of an angle inscribed in a semi-circle is equal to _____.
 (a) 90° (b) 180° (c) 120° (d) None of these
- (xv) Every line contains at least _____ distance points.
 (a) 2 (b) 3 (c) 4 (d) None of these
- (xvi) $\frac{1}{p} - p$ is a _____ expression
 (a) Polynomial (b) Rational (c) Irrational (d) None of these
- (xvii) The logarithm of the base of itself is _____.
 (a) 0 (b) 1 (c) 10 (d) None of these
- (xviii) If $(x^3 - x^2 - 226x + 1410) \div (x + 17)$ then the remainder is _____.
 (a) 0 (b) 20 (c) 40 (d) 60
- (xix) If the number of rows of matrix A is equal to the number of columns, then A is called _____ matrix.
 (a) Rectangular (b) Column (c) Square (d) None of these
- (xx) If $A = \begin{bmatrix} 3 & 2 \\ 5 & 4 \end{bmatrix}$, then $|A| =$ _____.
 (a) 2 (b) 3 (c) 4 (d) None of these

Section-B
(Short Answers)

Q.2 If $(x+y, 2) = (4, x-y)$ then find x and y.

Q.3 Simplify the following:

(a) $4^{2^2} = 4^{2^2}$ (b) $\sqrt[3]{\frac{64a^3b^3}{216c^3d^3}}$

Q.4 Find the value of $\log_9 128$ Q.5 Find the value of $x - y$ when $x + y = 7$ and $xy = 10$ Q.6 Simplify: $\frac{4}{a^2 - 4a - 5} + \frac{8}{a^2 - 1}$

Q.7 Factorize any two of the following:

(a) $x^3 + 15x + 36$ (b) $a^3 + a^2 + 1$ (c) $x^2(y-z) + y^2(z-x) + z^2(x-y)$

Q.8 Define any two of the following and draw the figures.

- (a) Opposite Rays (b) Supplementary Angles
 (c) Vertically Opposite Angles

Q.9 Find the solution set of any one the following:

(a) $|5y - 3| - 6 = 3$ (b) $\sqrt{25y - 6} = 4\sqrt{y + 3}$

Q.10 Eliminate "a" from the equation, $a + \frac{1}{a} = x$ and $a - \frac{1}{a} = y$

Q.11 Find the mean proportional between 14 and 56.

Q.12 Find the arithmetic mean when $D = x - 20$, $\Sigma D = 300$ and $\Sigma fD = 20$

Q.13 The two tangents drawn to a circle from a point outside it, are equal in length. Prove it.

Q.14 Construct a inscribed circle of a triangle ABC in which

$$m\overline{AB} = 4.5 \text{ cm}, m\overline{BC} = 5 \text{ cm and } m\angle B = 60^\circ$$

Q.15 Prove that: $\frac{1}{1 + \sin \alpha} + \frac{1}{1 - \sin \alpha} = 2 \sec^2 \alpha$

Section-C
(Descriptive)

Note: Attempt any THREE question from the following, each question carries 10 marks.

Q.16 Find the H.C.F of $6x^3 + 24x^2 + 6x - 36$ and $4x^3 - 8x^2 - 20x + 24$ by factor method.Q.17 If $A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ 0 & -1 \end{bmatrix}$ and $C = \begin{bmatrix} 0 & 3 \\ 1 & 5 \end{bmatrix}$, then Prove that $A(B - C) = AB - AC$.Q.18 (a) The right bisectors of the sides of a triangle are concurrent. Prove it.
 (b) The sum of the lengths of any two sides of a triangle is greater than the length of the third side. Prove it.Q.19 (a) Find the solution set of $2x^2 + 21 = 13x$ by factorization.
 (b) Find the solution set of $3(y^2 - 1) - 4(y + 1) = 0$ using quadratic formula.Q.20 (a) Find all the value of trigonometric ratio of 30° .
 (b) The foot of tower is at a distance of 20m from a point on the ground. The angle of elevation of the top of the tower from this point is of 60° . Find the height of the tower.